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A SIMPLIFIED TECHNIQUE FOR THE PLACEMENT OF SUBCUTANEOUS IMPLAN--ETC(U)
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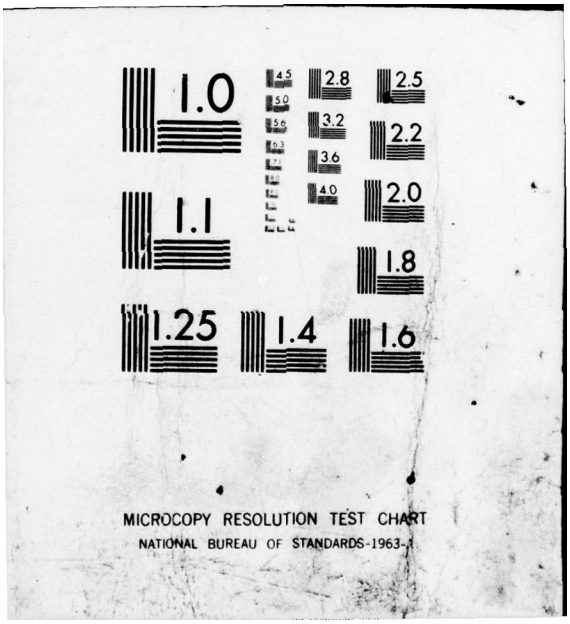
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

AD A069450

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)

A Simplified Technique for the Placement of Subcutaneous Implants

5. TYPE OF REPORT & PERIOD COVERED

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)

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Eugene D. Peguese

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS

US Army Institute of Dental Research
WRAMC
WASH, DC 20314

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

62775A, 3A162775A825
00, 007

11. CONTROLLING OFFICE NAME AND ADDRESS

US Army Medical Research and Development Command
HQDA (SGRD-RP)
Fort Detrick, MD 21701

12. REPORT DATE

5 February 1979

13. NUMBER OF PAGES

6

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)

15. SECURITY CLASS. (of this report)

NA

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for Public Release: Distribution Unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

Emery A. /Russell, Jr., Eugene D. /Peguese William T. /Charlton

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Subcutaneous Implants

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A 13 gauge spinal needle and stylet were modified to permit placement of subcutaneous implants with minimal trauma to the laboratory animal. This technique permits maximum utilization of the laboratory animal while making this procedure more humane.

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A Simplified Technique for the Placement of Subcutaneous Implants

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A Simplified Technique for the Placement of Subcutaneous Implants

INTRODUCTION

The study of soft tissue reaction to dental materials is of utmost importance in dental research. The increased range of usage of dental materials and the interest in tissue toxicity studies of both new and empirically accepted materials requires complete review and testing of those materials. Particularly important are those materials which are placed either against the mucosa, gingiva, or subgingival. It is also important to know the extent of leaching of material components into the surrounding tissues. One of the best methods of testing tissue reactions to these materials is by the subcutaneous placement in the rat belly. Because of the soaring costs of laboratory animals and their associated care, it becomes prudent to maximize their use. The technique of subcutaneous implantation to be presented permits maximum utilization of the laboratory animal and has proven to be more humane than the conventional surgical approach which requires dissection of the fascial planes followed by suturing to effect soft tissue closure.

MATERIALS AND METHODS

This method involves the use of a thirteen gauge spinal needle and stylet which have been shortened and sharpened (figure 1). A piece of plexiglass has been shaped to serve as a handle and to permit better control of the needle and stylet. A hole slightly smaller than the needle has been drilled through the center of the plexiglass handle. This permits a snug fit and secures the needle to the handle in a stable manner. Also depicted in figure one is a one centimeter segment of polyethylene tubing

with a .038 inch outer diameter which has been filled with the desired material to be studied. The Lumen of this thirteen gauge needle will accomodate polyethylene tubing with an outer diameter up to .06 inches. This instrument can also be utilized for any material which will withstand the expulsion pressure whether or not it is enclosed in tubing.

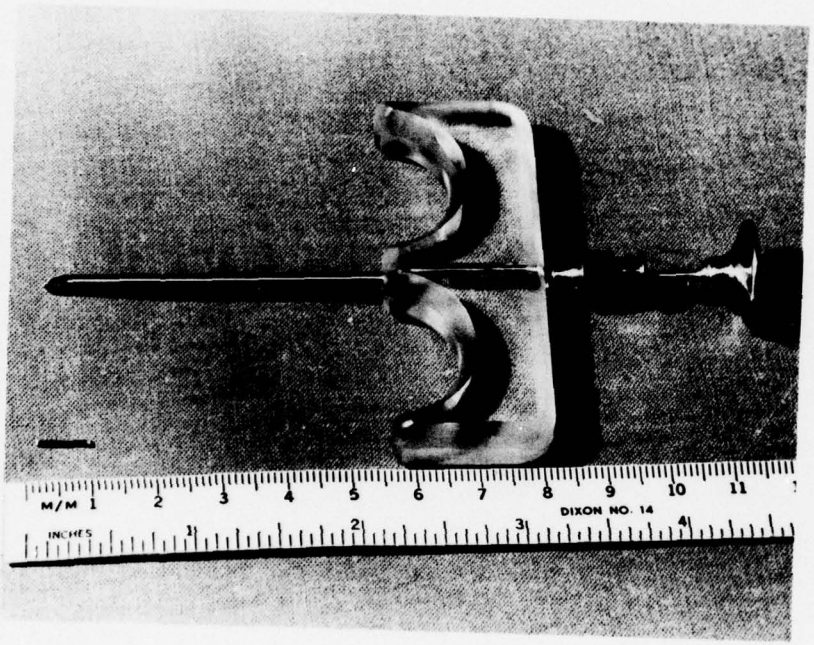
Before implantation the animal is anesthetized and the needle, with stylet in place, is used to penetrate the skin and carefully dissect subcutaneously along the fascial plane to the area where the implant is to be deposited (figure 2). The stylet is then removed and the segment of polyethylene tubing or other implant is inserted into the lumen of the needle. The stylet is again passed through the needle which assures placement of the implant at the desired site. The needle and stylet are partially withdrawn and redirected to another area for delivery of a second implant. The number of implants used is limited only by the size of the laboratory animal. Figure three shows six implants which have been passed thru only one skin puncture. The small puncture wound is not large enough to require placement of a suture. A comparison of postoperative radiographs reveals no evidence of loss or migration of the implants five days following their placement (figures 3 and 4).

SUMMARY

The technique presented offers many advantages in the study of soft tissue reaction to dental materials when subcutaneous implantation is employed. The placement of the material to be studied is performed rapidly and eliminates large wounds and excessive separation of fascial planes. The small wound tract permits placement of a greater number of implants with adequate soft tissue separating them. The implant may be

deposited at the desired site with less wound contamination and without spillage of the material along the wound tract. The entry wound is of such a size that no sutures are required. The major advantage of this technique is that fewer animals are required and the implants may be placed in a more humane manner.

In conducting research described in this report, the investigators adhered to the "Guide for the Care and Use of Laboratory Animals" as promulgated by the Committee on the Revision of the Guide for Laboratory Animal Facilities and Care of the Institute of Laboratory Animal Resources, National Research Council.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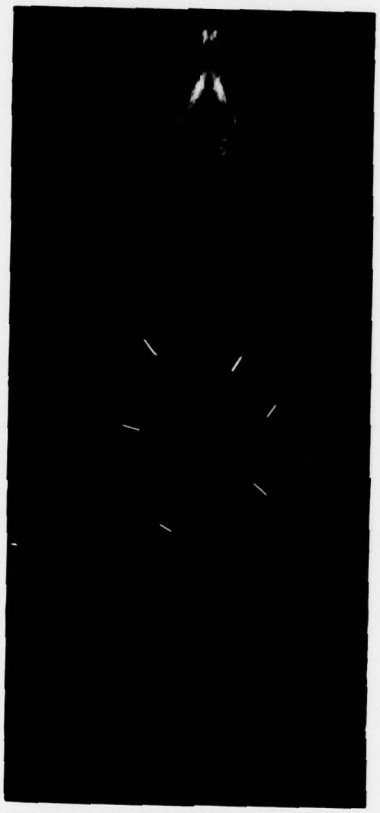

Legend of Illustrations

Figure 1

Modified thirteen gauge spinal needle and stylet with polyethylene implant.

Figure 2

Subcutaneous dissection for placement of implant.

Figure 3

Immediate post implant radiograph.

Figure 4

Five day post implant radiograph.